PUMPED STORAGE and Variable Renewables Integration

July 28, 2015 | Mexico City, Mexico

Auditorio del Centro de Capacitación de la SENER (CECAL)

Mexico has recently passed a major reform in the electric power sector. Besides the establishment of a wholesale electricity market, another central issue of this reform process is to promote a more intensive use of renewable and clean energy technologies, with wind and solar as the most promising renewable resources. Mexico has committed to an increase of the share of renewables in the power mix to 25% by 2018 while paving the way for more ambitious targets for clean energies in the years 2024 and 2035 with 35% and 40% of total electricity generation respectively. Likewise, and based on the information available in the National Inventory for Renewable Sources (INERE), wind and solar might supply all annual electricity needs of the country, but due to the variable nature of both resources, the need for additional fossil fuel based flexible capacity threatens to considerably increase the grid integration costs.

A way to provide the support required for the integration of variable renewable sources – by providing energy when the variable resources are not sufficient to meet demand as well as consume the energy generated at times of low demand – is the incorporation of Pumped Energy Storage plants designed to provide the necessary flexibility to the system.

The Mexican Energy Secretariat (SENER) and the Hydropower Coordination of the Mexican Productive State Enterprise Federal Electricity Commission (CPH-CFE) have initiated cooperation activities with national and international institutions to explore the role that pumped storage hydropower might play in this context. The CPH-CFE has identified several sites that are well suited for these kind of projects; however, the lack of domestic experience on how the benefits of pumped storage must be evaluated prevented potential projects to be realized in the past. Among the sites identified by CFE, the "Cerro del Topo" project in Monterrey, that could use waste water from the city of Monterrey, could be an ideal pilot project, due to its technical and environmental implications.

The objective of the workshop is to increase the knowledge of the Mexican stakeholders on the main drivers and barriers for the implementation of pumped storage projects, focusing on the potential role of pumped storage for the integration of variable renewables in Mexico. The event is organized by ESMAP and The World Bank team in collaboration with the Mexican Energy Secretariat (SENER) and the Hydropower Coordination of the Mexican Productive State Enterprise Federal Electricity Commission (CPH-CFE).

Mexico City, 28 July 2015 **Auditorio del Centro de Capacitación de la SENER (CECAL), Viaducto Río Becerra S/N & Pennsylvania, Colonia Nápoles, Delegación Benito Juárez, C. P. 03810**		
Time	**Presentation**	**Speakers**
08:30-09:00	**Light breakfast and registration**	
Session 1 **Moderator: Efraín Villanueva Arcos, SENER**		
09:00-10:00	**Welcome and Introduction**	**Leonardo Beltrán Rodríguez**, Undersecretary of Energy Planning and Transition **Silvia Martinez Romero,** Senior Energy Specialist, ESMAP, The World Bank **Francisco de la Parra Díaz de León,** Deputy Director of Generation of the Mexican Productive State Enterprise Federal Electricity Commission (CPH-CFE)

10:00-10:30	**Perspectives for pumped storage in Mexico** The impact of the Mexican Power Sector Reform and on-going studies	**Dr. Eduardo Humberto Guerrero Flores,** Head of the generation management section of the Coordination of Hydropower Generation of CPH-CFE
10:30-11:00	**Introduction to Pumped Storage Hydropower** Main Technologies and Applications Global Installed Capacity and Trends	**Frederic Louis,** Senior Hydropower Specialist, The World Bank
11:00-11:30 Coffee Break		
Session 2: International experience **Moderator: Silvia Martinez Romero, The World Bank**		
11:30-12:00	**Pumped storage in Spain** The current status and perspectives of pumped storage hydropower (PSH) in Spain and experiences from the stoRE project with an analysis of the European market framework conditions for PSH	**Gabriel García Naveda** Departamento de Integración en Red de EE.RR. CENER - Centro Nacional de Energías Renovables
12:00-12:30	**Pumped storage in Germany** Barriers, opportunities and market designs for PSH in Germany and Europe	**Klaus Schneider, PhD** Independent Consultant
12:30-13:00	**Pumped storage in Japan** Market Framework Conditions for PSH in Japan, operational and economic benefits of PSH and advanced technologies	**Shinichi Suganuma** Engineering Research Group, Power Grid Company, Tokyo Electric Power Co. (TEPCO)
13:00-13:30	**Pumped storage in the USA** Economics of pumped storage facilities: Drivers and barriers for implementation	**Donald Erpenbeck** Vice President & Global Director Hydropower, MWH USA
13:30-14:00	**Pumped Storage in Chile** Experiences from Valhalla's Espejo de Tarapacá project	**Juan Andrés Camus**, CEO Valhalla **Francisco Torrealba**, CSO Valhalla
14:00 - 15:30 Lunch		
Session 3: Moderated discussion: Potential role of pumped storage in Mexico; **Moderator: Emmanuel Gómez Morales, CFE**		
15:30-17:30	• **Enabling the regulatory framework: What are the regulatory and market reforms required to recognize the actual value of pumped storage?** • **Use of pumped storage for the integration of renewables in Mexico** • **Economic feasibility and comparison with other storage options** • **Technical challenges for implementation and operation** • **Financing and Collaboration with International Organizations** • **Knowledge exchange with other countries in the Region**	
17:30-17:45	**Closing Remarks and Next Steps:** SENER and CFE	